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AUTHOR Siegel, Donna Farrell; Hanson, Ralph A.
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ABSTRACT

Using extensive data gathered from a follow-up study on an early reading program which tested the reading competence of high school seniors who had received formal beginning reading instruction in kindergarten, an ancillary study investigated the effects of early formal reading instruction on bilingual students. Three of the dependent variables (reading comprehension, vocabulary, and remediation) from the full study were evaluated for 496 students identified as speakers of English as a second language. For each of these variables an analysis of variance was computed for three reading experience categories: (1) those receiving no kindergarten reading instruction; (2) those receiving some kindergarten reading instruction; and (3) those completing much/all of the kindergarten reading instruction provided. Consistent with the findings for other population groups of the parent study, results revealed that those bilingual students who began receiving their formal reading instruction in English at the kindergarten level had significantly better reading comprehension scores, significantly fewer remedial experiences, and generally better vocabulary scores as seniors in high schools than those bilingual students who did not. (One figure and one table of data are included for the bilingual study; an appendix containing a summary of the follow-up study is attached.) (KEH)

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UNIVERSITY OF SCIENCE AND ARTS OF OKLAHOMA

Phone (405) 224-3140 • FAX (405) 521-6244

CHICKASHA, OKLAHOMA 73018

Office of Teacher Education

Bilingual Background and Early Reading Instruction as Factors Related to the Reading Achievement of High School Seniors¹

Donna Farrell Siegel
University of Science and Arts of Oklahoma
P.O. Box 82317
Chickasha, OK 73018

Ralph A. Hanson
Hanson Research Systems
Westminster, CA 92683

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**Bilingual Background and Early Reading Instruction as
Factors Related to the Reading Achievement of
High School Seniors**

This research examines the policy issue of when schools should begin to provide formal reading instruction to bilingual children. As part of a national follow-up study on a kindergarten beginning reading program, extensive data were gathered on a sample of 3,959 high school seniors who entered kindergarten in the fall of 1973 (Hanson and Siegel, 1988a). This data base contains copious information on each student's background, including their birth date, the primary language spoken in the home, and whether their formal reading instruction began in kindergarten or first grade; it also includes measures of their reading competence and other dependent variables obtained when these students were seniors in high school. Collectively, these data allow us to determine if beginning formal reading instruction in kindergarten, as opposed to waiting until first grade, is related to adult reading competence and other outcome measures. The availability of a substantial sample of students from bilingual families (N = 496) allows us to examine this question specifically for the bilingual population.

Background

There is little agreement about the optimum time to initiate formal reading instruction with children. Some research has suggested that four- and five-year-old children who learn to read maintain their advantage over those children learning at later periods in their lives (e.g., Durkin, 1968; Mason, 1984; Beck, 1987). Others argue that such children are exceptions and that there is really no advantage in learning to read early. Still others insist that learning to read at an early age will have long-term negative effects (e.g., Rudolph and Cohen, 1984). They recommend that formal reading instruction should begin around 6¹/₂ years of age, or about the time the child's first permanent teeth appear. In a recent survey of kindergarten instructional practices (Bennett, 1986), about one-half of the schools reported some reading instruction was begun in kindergarten. Thus, current school practices reflect the same ambivalence about the timing of initial reading instruction as do researchers.

An even more complex debate is taking place in both the research and policy arenas concerning the timing and methods used to present formal reading skills to children from bilingual families (e.g., Garcia, 1987).

Here the debate centers around, not only the age at which formal reading instruction should begin, but also whether it should be in a bilingual or "English only" format.

One of the difficulties in researching both of these issues is that most research cannot afford the luxury of taking a longitudinal/developmental approach. As a result, most studies are of short duration and critics can dismiss any successful efforts by saying the effects obtained are probably temporary and will dissipate, or perhaps even turn negative, over time. Put another way, it is difficult to find studies with data that (a) can operationally define both the type and timing of students' initial formal reading instruction and, (b) have follow-up data documenting the achievement of students involved in such programs at a later point in time (e.g., at the end of their formal schooling).

In fact, the most influential study to examine the issue of the optimum age to begin reading instruction was carried out in the 1930's (Morphett and Washburne, 1931). That study simply related the mental age (IQ) of students upon entering kindergarten to their reading success at the end of second grade. On this basis, the authors strongly recommended that a minimum requirement

for initiating reading instruction was a mental age of six years. From that study, the now widely quoted chronological age of $6\frac{1}{2}$ years of age was derived. While this study has been widely criticized for many years, it is still cited as the primary basis for determining when reading instruction should begin.

Until recently, there have not been any studies of substantial scope to refute these contentions. However, a 1987 kindergarten reading study (Hanson and Siegel, 1988a) was able to do just that; this national study was able to obtain enough follow-up data to causally link information about the age at which children began receiving formal reading instruction to their adult reading status.

The major conclusion from the kindergarten reading follow-up study was that those students who received formal beginning reading instruction in kindergarten, as opposed to those beginning it in first grade, were clearly better readers as seniors in high school. Further, this result held up across gender, ethnic, and SES groups (Note: A complete summary of the study is given in Appendix A). Whether this result will hold up for bilingual students as well is the primary research question this study seeks to answer.

Methods

The kindergarten reading study employed a follow-up design (see Hanson and Siegel, 1988a for a full discussion of the study methodology). The original kindergarten population referenced is a group of over one hundred and twenty thousand students in 5,000 elementary schools (430 districts) across the country which used an innovative kindergarten reading program in the 1973-74 school year (Hanson and Schutz, 1978). A sample of those 430 districts (N=24), for which data were available from the 1973-74 school year, were contacted in 1985 and agreed to take part in a follow-up study of this kindergarten reading program. The participating students were seniors in high school during the 1985-86 school year. Data were obtained, not only from the seniors who had received the kindergarten reading instruction, but also from their classmates within and between schools and districts who had not received the instruction.

The data collection booklet included standardized measures of both reading comprehension and vocabulary, as well as a self-report questionnaire specifically designed to measure the major factors affecting reading development and to provide other related information for

this study. This carefully developed questionnaire, referred to as *The Reading Biographer* (Hanson and Siegel, 1988b), gathered detailed information on the family background, schools attended, and educational experiences of the high school seniors in the sample population. Collectively, the information obtained from this data collection booklet compiled the data base used in this study.

Data Sources

The study obtained follow-up data on a sample of 3,959 high school seniors from 24 of the districts which had participated in the original kindergarten reading implementation studies (Hanson and Schutz, 1978). They represented about 180 of the original elementary schools. Because of the size of the sample and the fact that about one-half of the participants (n=2100) began receiving reading instruction in kindergarten, there is considerable variability in terms of the major study variables of interest. This allowed students to be divided into three major categories, based on their initial reading experience: (1) those students receiving none of the kindergarten reading instruction, (2) those receiving some of the kindergarten reading instruction

(i.e. completed 1-7 units of instruction), and (3) those completing most or all of the kindergarten reading instruction (i.e., completed 8-10 units of instruction). It should be noted, however, that the vast majority of students receiving the kindergarten reading instruction were from Title I schools; that is, from "disadvantaged" backgrounds. Since social class background has consistently been cited as major predictor of school achievement (i.e., $r = +.40$ to $+.50$), it was anticipated that the results of the comparisons between those students receiving the kindergarten reading instruction and those students who did not (i.e., those from middle class and upper class backgrounds) would not show a positive relationship to the kindergarten reading instruction. In other words, students from disadvantaged backgrounds simply do not out-score students from middle class backgrounds on standardized measures of school achievement. It was hoped, however, that these comparisons could provide some insight into the contention that beginning formal reading instruction in kindergarten would lead to long-term negative effects.

The more appropriate comparison was between those students who received some of the kindergarten reading

instruction and those who received most or all of the instruction. Compared to the first group, these two groups were more homogeneous, particularly in regard to social class. However, it was also anticipated that the probability of being able to relate any difference between these two groups to a kindergarten reading program after a period of more than twelve years was almost non-existent.

Amazingly, though, the results of the follow-up study indicated that, in spite of being from a lower social class group, those students who received the kindergarten reading instruction scored significantly better on all indicators of educational performance and competence in reading than those who did not, and those that received more of the reading instruction score better than those receiving only a portion of the program. Furthermore, as mentioned earlier, these results were consistent across districts and by SES, ethnic, and gender groups.

In the present study, three of the dependent variables from the full study are evaluated for those students defined by speaking English as a second language (ESL). Figure 1 describes the three dependent variables. For each of these variables an analysis of

variance (ANOVA) was computed for the three kindergarten reading experience categories: (1) No kindergarten reading instruction, (2) some kindergarten reading instruction, and (3) much/all kindergarten reading instruction. The results appear in the following section.

Insert Figure 1 about here

Results

There were 496 students in this sample, or 12.5% of the full study sample ($N = 3,959$). These students were reportedly from homes in which both parents and children regularly spoke a language other than English. About one-half of these students spoke a European language other than Spanish; about $\frac{1}{3}$ spoke Spanish, and the remainder were in the "Asian" and "Other" categories.

Insert Table 1 about here

Table 1 reports the results of a one-way ANOVA computed for each of the three dependent variables using the three kindergarten reading comparison categories. In examining these categories for each dependent

variable, the results show that kindergarten reading instruction was a significant factor for two of the three dependent variables: "Remedial Experiences" and "Reading Comprehension." Looking at the three comparison groups for "Remedial Experiences", we see that the students who received the full kindergarten reading instruction had 14% fewer students in remedial classes as compared to those who had none and 4% fewer than those who had received only part of the instruction. This has important economic, as well as educational, implications for school districts; remediation is not only costly, but largely ineffective and highly related to drop-out rates. Thus, school districts can compute the dollar amount it would cost them, in remediation costs alone, to remediate 14% of its student population as compared to implementing a beginning reading program in kindergarten.

Turning to the "Reading Comprehension" variable, once again, the unlikely result emerges. That is, the bilingual students from the Title I schools (i.e., "disadvantaged") scored significantly higher than those from the non-Title I schools (i.e., "advantaged"). Also, as with the other two variables, we see that the mean score is higher for those students who received

most or all of the reading instruction than for those who received only part of the instruction. These findings suggest that immersing bilingual students in an English speaking program of beginning reading instruction at an early age is both appropriate and effective. Furthermore, the more of this kind of instruction they have, the better readers they will be as adults.

Although "Vocabulary" was not statistically significant, the mean scores clearly follow the same consistent pattern of increase associated with each of the three levels of kindergarten reading implementation. That is, the mean score was highest for those students who received all of the instruction and lowest for those students who did not receive any kindergarten reading instruction.

Using these data and examining the separate means for all of these variables (within each cell of the ANOVA), the following conclusions seem warranted. The bilingual students who received the kindergarten reading instruction showed clear patterns of higher vocabulary and reading comprehension scores and required less remediation as seniors in high school than those who did not receive the early reading instruction. This is an

exceptional finding and particularly important in an educational since those students receiving the early reading instruction were from a lower social class background than those not receiving it.

Equally as amazing, however, is the finding that the mean scores for all three variables were higher for the students who received most or all of the kindergarten reading instruction than for those who only received a portion of the program. Being able to relate such subtle effects to an educational intervention over a short-term period would be unusual; being able to discern such effects over a period of twelve years can only be called astounding.

Conclusions

The results of the analyses presented in this study provide support for the conclusion that the positive effects of beginning formal reading instruction in kindergarten generalize to bilingual children. That is, consistent with the findings for other population groups, those bilingual students who began receiving their formal reading instruction in English at the kindergarten level had fewer remedial experiences and better vocabulary and reading comprehension scores as

seniors in high school than those bilingual students who did not. Further, those students receiving the kindergarten reading instruction were from a lower social class background than those not receiving the instruction. How many other educational interventions, measured either concurrently or over time, have resulted in students from lower social class backgrounds scoring higher on tests of reading achievement than students from middle and upper class backgrounds? The question that now faces school policy makers is, "Why are we not providing formal reading instruction to all children at the kindergarten level?"

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1. AIMS Reading Comprehension Score (RDGSCR): A standardized test of reading comprehension skill (Sabers, D., 1985).
 2. Vocabulary Score (VOCSCR): A test used to estimate the size of one's reading vocabulary (Broach, Hanson & Siegel, 1988).
 3. Remediation (REMEDI): An index reflecting the amount of remedial reading experiences in elementary and high school (Note: a lower number indicates fewer remedial experiences).

Figure 1: Description of the three dependent variables

Table 1. ANOVA results for the three dependent variables by kindergarten beginning reading program (BRP) categories.

Kindergarten BRP Categories	Dependent Variables		
	Remedial Experiences	Vocabulary	Reading Comprehension
No Kindergarten BRP	.32 (n=286)	16.1 (n=292)	11.6 (n=290)
Some Kindergarten BRP (1-7 units)	.22 (n=36)	16.2 (n=36)	13.0 (n=36)
Most/All Kindergarten BRP (1-10 units)	.18 (n=164)	17.0 (n=168)	13.2 (n=167)
p level	.01	.08	.00

APPENDIX A

Summary of the Kindergarten Reading Follow-up Study

THE LONG-TERM EFFECTS OF LEARNING TO READ IN KINDERGARTEN: A TWELVE YEAR FOLLOW-UP STUDY¹

Ralph A. Hanson and Donna Farrell Siegel

SUMMARY

When, how, and to whom formal reading instruction should be provided are central issues of continuing controversy in education. This study examined these issues using extensive and unique data sources resulting from a longitudinal research effort spanning nearly twenty years. Specifically, this study sought to answer two questions: (1) Are there any long-term effects associated with receiving formal reading instruction in kindergarten? and (2) Are there any special effects for disadvantaged students of receiving this instruction?

To obtain answers to these questions, special instruments were developed and administered to 3,959 students from 24 school districts in ten states in the spring of 1986. These districts were part of an original set of 430 school districts (including approximately 2000 elementary schools and 5000 kindergarten classes) which implemented the Beginning Reading Program (BRP) during the 1973-74 school year with the support of Title III funding. This Program was developed between 1965 and 1971 by a regional educational laboratory and embodied many unique and innovative features. Among these were carefully researched content specifications which resulted in the optimal sequencing and presentation of the critical sounds and words needed to gain initial basic sight vocabulary. In this way, the children were able to read simple stories after only one week of instruction.

¹See Hanson, R., and Siegel, D. F. (1988) for complete information and the full results of this research.

These reading skills were introduced and taught using systematically developed materials and instructional procedures. The instruction included group flashcard lessons, playing simple games, and reading from a set of 52 consumable (paperback) story books. Each book contained a short story illustrated with a series of animal characters capitalizing on preschoolers' natural interest in animation. Each child was provided with a full set of these 52 books. After the children read them aloud in class, the books could be taken home; this allowed for additional practice and increased parental involvement.

Throughout instruction emphasis was placed on encouraging each child to participate as he or she was ready and ensuring that all efforts, including non-responses, were positively received by the teacher. Special teacher training sessions emphasizing positive reinforcement, a lot of practice, and full participation by all students were carried out in each district prior to the use of the program. Obtaining responses from each child and a brief evaluation after each of the ten units of instruction provided the means for teachers to confirm that the children had acquired initial reading skills. For those having difficulties, additional individual instruction on each specific skill was recommended and special materials were provided.

The progress of each class, school, and district which participated in this national implementation of the BRP in 1973-74 was monitored and evaluated on the basis of extensive data gathered throughout the school year. These data were summarized and reported to the federal government as part of the Title III project evaluation requirement. The data were also extensively analyzed for policy implications and the results were reported in a series of technical reports, professional papers, and articles (e.g., Hanson and Schutz, 1978).

While these inquiries had many important research implications, the most substantive finding was that virtually all kindergarten students could be taught to read using this Program. These studies indicated that kindergarten students could learn to read quite

well when teachers would devote about 25 minutes per day over a period of 25 school weeks to the reading instruction Program.

This did not mean, of course, that all teachers fully implemented the Program. There were considerable differences in the number of BRP units completed by each school. Furthermore, these implementation differences were found to be related to students' reading abilities at the end of their kindergarten year (e.g. Hanson and Schutz, 1978). Thus, the findings confirmed that the differences in the number of BRP units completed by each school were related to the amount of time (instructional weeks) the school devoted to BRP instruction and not to the measurable characteristics of children, such as their language skills upon entering kindergarten. The only distinction between children from the most advantaged as compared to those from the least advantaged backgrounds was that, on average, slightly more time was expended to complete the first unit of the Program. After completion of that first unit, the pattern of both instructional time requirements and achievement were identical for all classes.

While these results were important, they did not address the most serious criticism of teaching children under six years of age to read: that it would have a serious, deleterious impact on both their attitudes toward and skills in reading at a later point in time. This proposition dates back to a heavily criticized study from the 1930's (i.e., Morphett & Washburn, 1931). This fifty-seven year old study is still the major research cited in early childhood education texts to support the notion for not teaching reading before the age of six. It was a new, more thorough examination of this old proposition, that the Kindergarten Follow-Up Study (KFS) sought to provide.

In obtaining data from high school seniors, three instruments were employed. A norm-referenced reading test and a specially designed reading vocabulary test provided detailed information on their current reading ability. A third instrument, referred to as *The Reading Biographer*, assessed a host of other educational indicators and related factors

such as: (1) family background, (2) grades and educational experiences (from preschool through high school), and (3) current interests, educational plans, and leisure activities. *The Reading Biographer* also obtained the names of each school the students attended. All instruments were carefully developed, pilot tested, and revised several times in the year preceding their use in this research.

Approximately half of the 3,959 students in the follow-up study had learned to read in kindergarten. They represented 127 of the original set of 2,000 elementary schools that implemented the BRP in 1973-74. Specific data, such as how many BRP units students completed and a summary of their tested reading skills at the completion of kindergarten, were combined with the follow-up data for the analyses presented in this research (See Hanson and Siegel, 1988) for full details on study procedures and data analyses).

Briefly, these analyses centered around two designs: (1) a school-level design which examined and compared mean reading score differences between schools which implemented some of the kindergarten BRP (i.e., 1-7 units) with those implementing most or all of the BRP (i.e., 8-10 units), and (2) a student-level design which examined and compared the mean reading score differences between students who had and had not participated in the kindergarten reading program. In both designs, differences on many follow-up variables were evaluated. These variables included: (1) current reading and vocabulary skills, (2) interest in, attitudes toward, and daily amount of reading, and (3) schooling variables such as the number of remedial or honors classes, current grades and coursework, and average yearly attendance.

The analyses within both designs showed clear and consistent support for teaching reading in kindergarten. Participation in a systematically developed and carefully implemented kindergarten reading program was related, not only to higher reading skills, but to higher performance on all indicators of reading competency. Further, students from

schools completing more of the Program were better readers as high school seniors when compared to those from schools completing only a portion of the program. In comparing the kindergarten reading students to other students in their same district who did not receive any kindergarten reading instruction, the results were even more conclusive. Learning to read in kindergarten was not only related to higher reading skills but it reduced the need for remediation at both the elementary and high school levels. Students receiving the kindergarten reading instruction fared better in all ways than those who did not receive the instruction; these results were consistent across districts, and by racial/ethnic, gender, and socioeconomic groups. In all comparisons, the kindergarten reading students emerged as better off than those who did not receive the instruction.

These conclusions are based on extensive data analyses reported in Hanson and Siegel (1988); only one table will be presented here. Table 1 shows the practical as well as the statistical results by presenting data on one global measure of adult literacy (defined as reading at or below the fifth grade level as a senior in high school). This variable is based on the reading stages defined by Jeanne Chall and is derived by using both the reading vocabulary and comprehension test scores. The entries in this table show the percentage of students in each category who were reading at or below the 5th grade level as seniors in high school; these data are given by ethnic/race, gender, and social class groups. These results show quite clearly that the students who learned to read in kindergarten fared better in all groups than those who did not. Depending on the specific group, these differences varied in range from 2% to as much as 16%. Note, however, that the results for each group consistently favor the kindergarten readers. As the table indicates, overall there were about 8% fewer of these poor readers among students who had the kindergarten reading program as compared to those who did not.

Table 1. Percent of students in each kindergarten experience comparison category that can be classified as functionally illiterate as seniors in high school (i.e., reading at or below the 5th grade level)

Biosocial Variables	No BRP/ No BRP School 1	No BRP/ BRP School 2	BRP/ BRP School 3	Overall %
<u>Ethnic Background</u>				
Asian	13	10	01	9
Black	44	39	28	37
Hispanic	35	31	26	31
Native American	20	22	18	20
Others	8	8	6	7
<u>Gender</u>				
Female	15	17	11	14
Male	18	18	11	15
<u>Socioeconomic Status</u>				
Low	21	25	14	19
Medium	18	16	11	15
High	7	10	5	7
Overall	17	18	11	15

These data are further illustrated in Figure 1.:

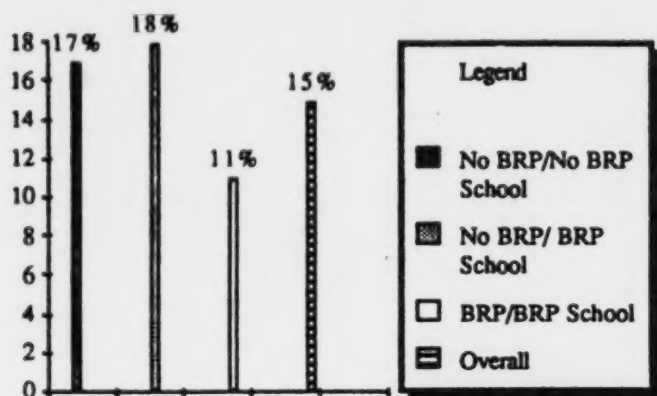


Figure 1. Percent of students in each kindergarten experience comparison category that can be classified as functionally illiterate as seniors in high school (i.e., reading at or below the 5th grade level)

Couple these results with the fact that the schools which taught reading in kindergarten included more students from disadvantaged backgrounds (lower SES) and these results are even more convincing. For these students to be even comparable to higher SES groups which did not receive kindergarten reading would be a significant accomplishment. The fact that they read better and there were substantially fewer students in the functional illiterate category is extraordinary.

It should be noted that such convincing evidence favoring kindergarten reading instruction was totally unexpected. In the original grant proposal, the expectation was that the early reading experience might show some positive long-term impact among disadvantaged groups. This modest expectation was in direct contrast to the prevailing notions of early childhood specialists who have cautioned against providing formal reading instruction to children prior to the age of 6 for fear of the long-term negative effects it would have on their reading skills and attitudes.

This study clearly turns this long-standing educational maxim into a myth. Not only did the disadvantaged students benefit from the kindergarten reading instruction, but

so did the advantaged groups. Perhaps even more astounding is the fact that, collectively, the high school seniors who participated in the kindergarten reading program were from lower socioeconomic groups than those who did not. This was consistent with the earlier evaluations of the kindergarten reading installations which showed that most districts placed the program in schools with the lowest reading levels... those that typically served disadvantaged populations. Thus, inspite of an overall lower SES level, the students who received the kindergarten reading program still outperformed the higher SES students who did not! When was the last time anyone saw test results showing a lower SES group outperforming a higher SES group on a norm-referenced test of reading achievement? Further, when have you seen such significant differences directly linked to an educational intervention provided by schools?

The major findings of this research can be stated in a single sentence: **the students who learned to read in kindergarten were found to be superior in reading skills and on all educational indicators as seniors in high school.** Further, there was absolutely no evidence of any negative effects and, hence, no support for the argument that early reading instruction might associated with negative long-term effects. The national policy implications of this research is that support for efforts by schools to implement formal reading instruction at the kindergarten level should be provided in a manner consistent with the methodology and instructional strategies of the Beginning Reading Program.

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Papers were presented on this study at the American Educational Research Association National Convention in San Francisco (April, 1986) and in Washington, D.C. (April, 1987). Should the enclosed summary not provide enough information for your purposes, you may obtain the other documents listed below for the cost of printing and mailing.

___ Copies of the 1987 AERA paper, The Long-term Effects of Learning to Read in Kindergarten @ \$4.00 each.

___ Copies of the Technical Report @ \$25.00 each.

___ Copies of the Beginning Reading Program evaluation article @ 3.00 each.

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